Miller®

November 1990 FORM: OM-1558A

Effective With Style No. KB-8

MODEL: MT-24-12-1
MT-24-25-1
MT-24F-12-1
MT-24F-25-1
MT-24VF-12-1
MT-24VF-25-1

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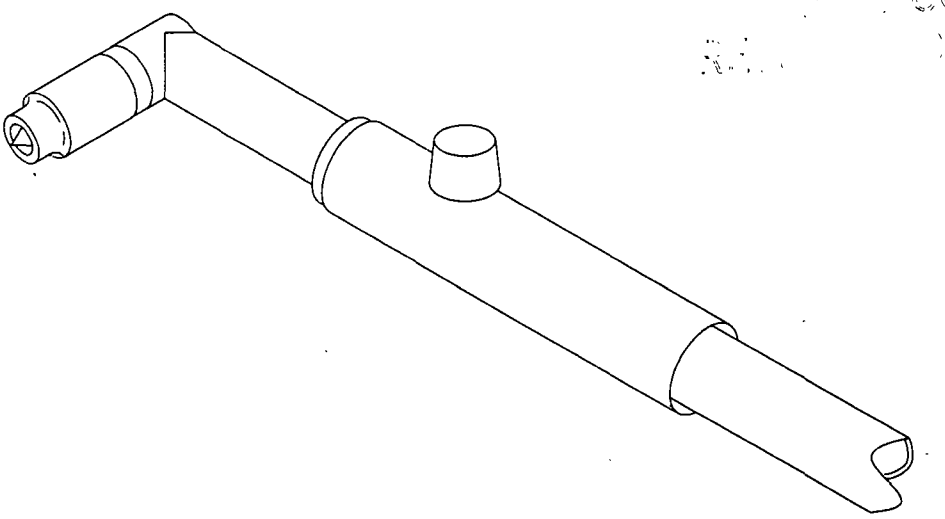

OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of both this manual and the power source manual used with this unit, with special emphasis on the safety material throughout both manuals, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. *Do not allow untrained persons to install, operate, or maintain this unit.* Contact your distributor if you do not fully understand these instructions.

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SA-120 672

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LIMITED WARRANTY

EFFECTIVE: AUGUST 6, 1990

This warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions hereof, MILLER Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by MILLER is free from defect in workmanship and material as of the time and place of delivery by MILLER. No warranty is made by MILLER with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warrantied by their manufacturer for two years from date of original purchase, except Deutz engines which have a one year, 2000 hour warranty.

Except as specified below, MILLER's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

MILLER shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components ..... 1 year
2. Load banks ..... 1 year
3. Original main power rectifiers ..... 3 years (labor – 1 year only)
4. All welding guns, feeder/guns and torches .... 90 days
5. All other MILLERMATIC Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor 60 days
7. Batteries ..... 6 months

provided that MILLER is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, MILLER may honor claims submitted by the original user within the foregoing periods.

In the case of MILLER's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at MILLER's option (1) repair or (2) replacement or, where authorized in writing by MILLER in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized MILLER service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. MILLER's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a MILLER authorized service facility, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, MILLER shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

RECEIVING-HANDLING

Before unpacking equipment, check carton for any damage that may have occurred during shipment. File any claims for loss or damage **with the delivering carrier**. Assistance for filing or settling claims may be obtained from the distributor and/or the equipment manufacturer's Transportation Department.

When requesting information about this equipment, always provide the Model Description and Serial or Style Number.

Use the following spaces to record the Model Designation and Serial or Style Number of your unit. The information is located on the data card or the nameplate.

Model _____

Serial or Style No. _____

Date of Purchase _____

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SECTION 1 – SAFETY RULES

WARNING: UNSAFE PROCEDURES OR PRACTICES can cause serious personal injury or death.

- *Read, understand, and follow ALL of these safety rules before installing, operating, or servicing this equipment.*
- *Be sure that all end users of this equipment, the operator and helpers, read and understand these safety rules.*

1-1. PREVENT ELECTRIC SHOCK

Touching live electrical parts can cause severe burns to the body or fatal shock. Severity of electrical shock is determined by the path and amount of current through the body. Therefore:

1. Do not touch live electrical parts.
2. Do not work in wet or damp areas.
3. Wear dry insulating gloves and body protection.
4. Disconnect all power before installing or servicing this equipment.
5. Turn off all equipment when not in use.
6. Properly install and ground the welding power source according to its Owner's Manual and all applicable codes.
7. Do not use worn or damaged cables or cables that are too small or poorly spliced.
8. Do not wrap cables around your body.
9. Do not touch electrode and any grounded object or circuit at the same time.
10. Use only well-maintained equipment. Repair or replace damaged parts at once.

1-2. PROVIDE PROTECTION FROM FUMES AND GASES

Breathing welding fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes.
2. Use adequate ventilation in the work area to keep fumes and gases from your breathing zone and the general work area.
3. If ventilation is inadequate, use an approved breathing device.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for any materials used.

1-3. PROTECT EYES AND SKIN FROM ARC RAYS; PROTECT EARS FROM NOISE

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper filter lens (see ANSI Z49.1 for detailed information).
2. Wear a welding helmet fitted with a proper filter lens (see ANSI Z49.1 for detailed information).
3. Use protective screens or barriers to protect others from flash and glare.
4. Wear protective clothing and foot protection.

1-4. PREVENT FIRES AND BURNS

The hot workpiece, hot equipment, other hot metal, spatter, and arc sparks can cause fires and burns.

1. Wear correct eye, face, and body protection in the work area.
2. Allow work and equipment to cool before handling.
3. Do not weld near flammable material.
4. Watch for fire, and keep a fire extinguisher nearby.
5. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-5. PROTECT COMPRESSED GAS CYLINDERS

Since gas cylinder are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinder so that they cannot fall or tip over by fastening them to a mounting bracket, wall, or other stationary support.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.

1-6. PROVIDE PROTECTION FOR SPECIAL SITUATIONS

1. Do not weld or cut containers or materials which have held or been in contact with hazardous substances unless they are properly cleaned and inspected.
2. Do not weld or cut painted or plated parts unless special ventilation is provided to remove highly toxic fumes or gases.

3. Since welding can affect pacemakers, keep all pacemaker wearers out of the work area. Have them consult a doctor before coming near a welding operation.

1-7. PROVIDE PROPER EQUIPMENT MAINTENANCE

Improperly maintained equipment can result in poor work, but most importantly it can cause physical injury or death through fires or electrical shock. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are fully qualified.
2. Before performing any maintenance work inside a power supply, disconnect the power supply from the electrical power source.
3. Maintain cables, grounding wire, connections, power cord, and power supply in a safe working order. Do not operate any equipment in questionable condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres, and inclement weather.
5. Keep all safety devices, guards, panels, and covers in position and in good repair.
6. Use equipment for its intended purpose. Do not modify it in any manner.

1-8. ADDITIONAL SAFETY INFORMATION

For more information on safe practices for setting up and operating electric welding and cutting equipment and on good working habits, ask your welding equipment supplier. For your protection, read and comply with the latest editions of the following standards:

1. ANSI Standard Z49.1 available from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
2. AWS Standard A6.1, "Recommended Safe Practices for Gas Shielded Arc Welding," available from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
3. AWS Standard F4.1, "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances," available from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126.
4. NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
5. NFPA Standard 70, "National Electrical Code," available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.
6. ANSI Standard Z87.1, "Safe Practice for Occupation and Educational Eye and Face Protection," available from the American National Standards Institute, 1430 Broadway, New York, NY 10018.
7. OSHA Standard 29 CFR, Part 1910, Subpart Q, "Welding, Cutting, and Brazing," available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
8. CSA Standard W117.2, "Code for Safety in Welding and Cutting," available from the Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario, Canada M9W 1R3.
9. See also the Standards Booklet Index in the welding power source Owner's Manual.

SECTION 2 – SAFETY PRECAUTIONS AND SIGNAL WORDS

2-1. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 – Safety Rules.

2-2. SAFETY ALERT SYMBOL AND SIGNAL WORDS

The following safety alert symbol and signal words are used throughout this manual to call attention to and identify different levels of hazard and special instructions.

This safety alert symbol is used with the signal words WARNING and CAUTION to call attention to the safety statements.

WARNING statements identify procedures or practices which must be followed to avoid serious personal injury or loss of life.

CAUTION statements identify procedures or practices which must be followed to avoid minor personal injury or damage to this equipment.

IMPORTANT *statements identify special instructions necessary for the most efficient operation of this equipment.*

SECTION 3 – SPECIFICATIONS

Table 3-1. Specifications

Model	Ampere Rating At 100% Duty Cycle DCEN; ACHF	Tungsten Size Capacity	Cable Length	Torch Body	Cooling Method	Weight	
						Net	Ship
MT-24-12-1	80 Amperes With Argon*	.020 thru 3/32 in. (0.5 thru 2.4 mm)	12.5 ft. (3.8 m)	Length: 8.1 in. (206.0 mm) Handle Diameter: 0.75 in. (19.0 mm) Weight: 2.0 oz. (57.0 g)	Air	2 lbs. (0.9 kg)	2.5 lbs. (1.1 kg)
MT-24-25-1			25 ft. (7.6 m)			4.5 lbs. (2.0 kg)	5.0 lbs. (2.3 kg)
MT-24F-12-1 MT-24-VF-12-1			12.5 ft. (3.8 m)	Length: 8.0 in. (203.0 mm) Handle Diameter: 0.75 in. (19.0 mm) Weight: 3.0 oz. (85.0 g)		2 lbs. (0.9 kg)	3 lbs. (1.1 kg)
MT-24F-25-1 MT-24VF-25-1			25 ft. (7.6 m)			4.5 lbs. (2.0 kg)	5.0 lbs. (2.3 kg)

*Rated With Gas Lens Collet Body

3-1. DUTY CYCLE

The duty cycle of a welding torch is the percentage of a ten minute period that a torch can be operated at a given load. This torch is rated at 100% duty cycle using argon shielding gas. This means that the torch can be operated at rated load conditions continuously.

CAUTION: EXCEEDING THE RATED AMPERAGE and duty cycle can result in damage to the torch.

- *Do not exceed rated amperage and duty cycle stated in Table 3-1.*

3-2. DESCRIPTION

This air-cooled torch is specifically for use with the Gas Tungsten Arc Welding (GTAW) process. The alphanumeric model designation refers to the following:

24 - Ampere Rating: 80 Amperes
12 - 12.5 ft. (3.8 m) Cable
25 - 25 ft. (7.6 m) Cable
1 - One-Piece, High-Flex Cable
V - Gas Valve
F - Flex Head

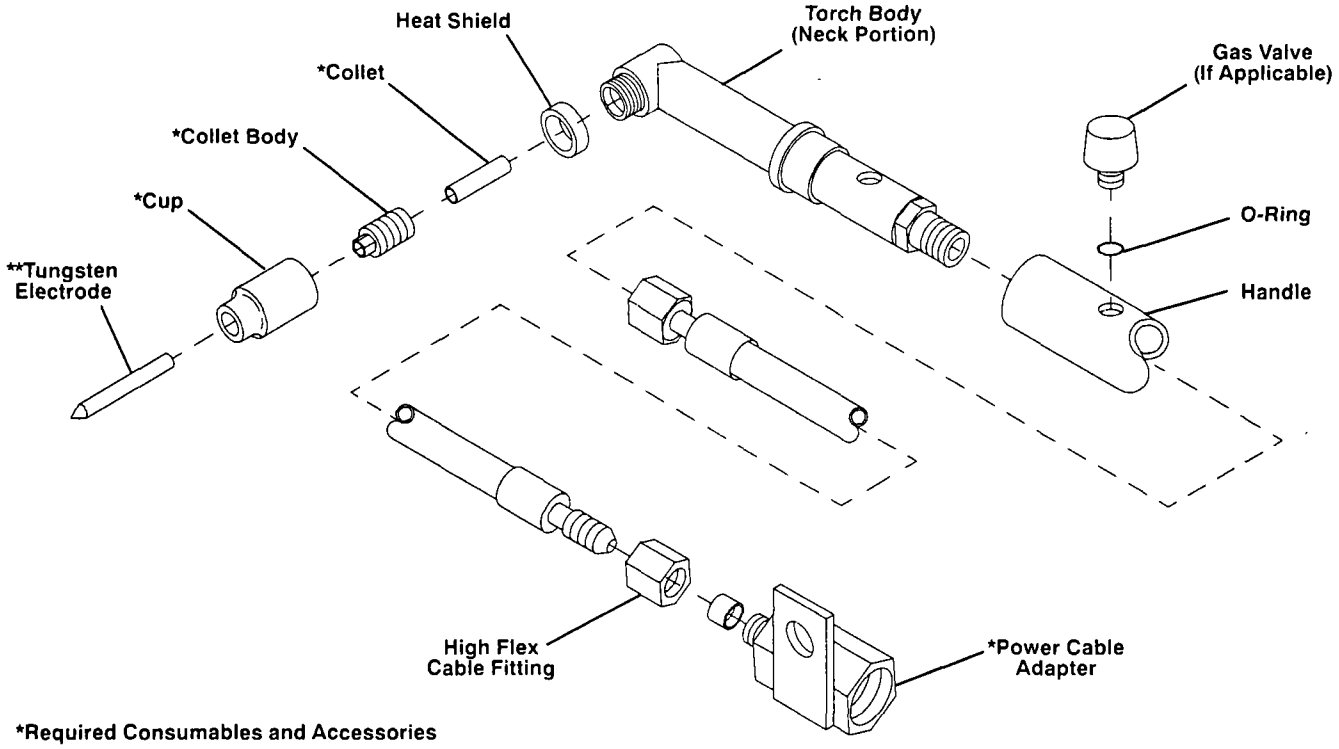


Figure 4-1. Torch Components

4-1. TORCH BODY (Figure 4-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before installing torch.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

The torch body is shipped requiring consumables and accessories indicated in Figure 4-1: Cup, collet body, collet, power cable adapter (with flex cable only), and tungsten electrode.

A. Assembly

Assemble torch as follows:

1. Install collet, slotted end last, into collet body.
2. Install collet body and collet into torch body making sure heat shield is in place.
3. Install properly prepared tungsten electrode (see Section 6-2) into collet body, and position electrode tip outside cup rim. Tighten collet body.
4. Install cup onto collet body.
5. To readjust electrode position, remove cup and loosen collet body.

IMPORTANT: *As a general rule, electrode extension should equal electrode diameter; but exact electrode extension may vary according to application.*

B. Flexible Head Adjustment

CAUTION: BENDING RIGID HEAD TORCH can damage torch.

- *Do not bend rigid head model torches.*

Warranty is void if rigid head torch is bent in any manner.

Improper bending of flexible head torch can damage gas hose. Make sure to bend only within the middle portion of torch neck (see Figure 4-1). Restrict bending angle to 90 degrees.

4-2. GAS HOSE CONNECTIONS AND GAS VALVE (If Applicable) (Figures 4-1 Thru 4-3)

IMPORTANT: *If power source is not equipped with a gas valve, a torch gas valve is required (see Figure 4-2).*

A. High Flex Cable Assembly

The high flex cable assembly contains the power cable within the gas hose. The high flex cable has a 3/8-24 female right-hand fitting (see Figure 4-1).

To install high flex cable, connect high flex cable fitting to power cable adapter.

If torch includes a gas valve, connect a suitable length of gas hose (extra hose not supplied) from power cable adapter to regulator/flowmeter (see Figure 4-2).

If torch is without gas valve, connect a suitable length of gas hose (not supplied) from power cable adapter to gas valve outlet. Connect extra gas hose (not supplied) from gas valve inlet to regulator/flowmeter (see Figure 4-3).

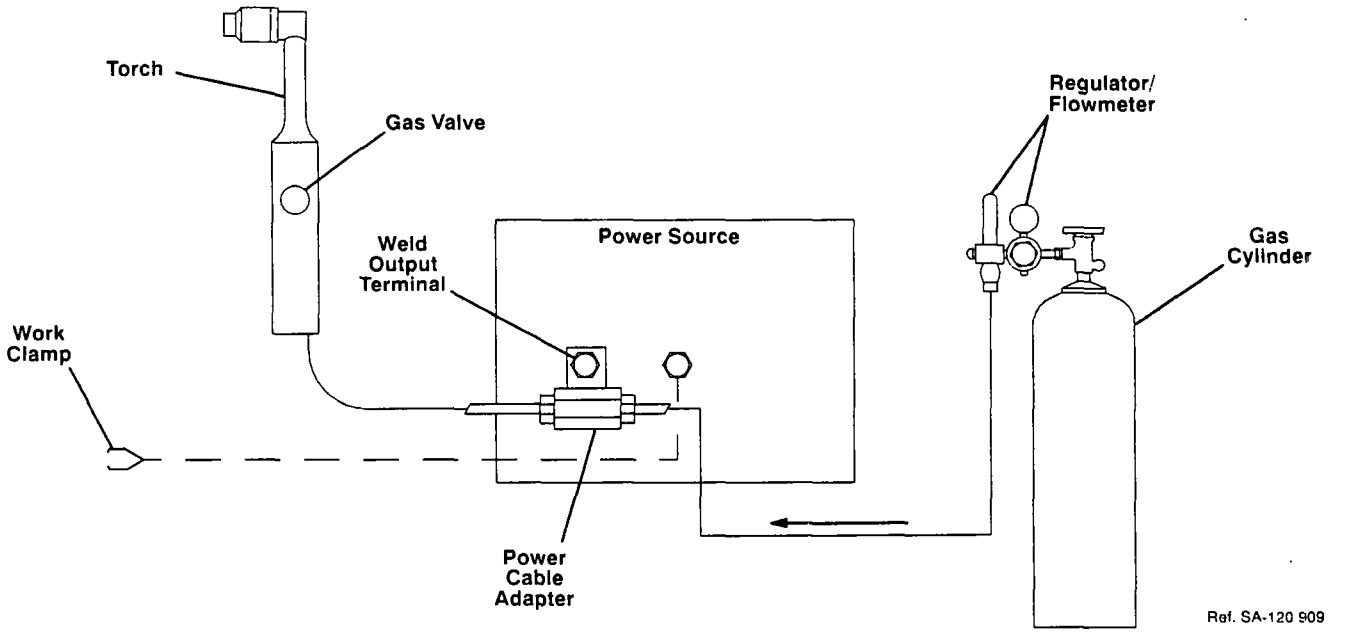


Figure 4-2. GTAW Torch Connection Diagram For Models With Gas Valve

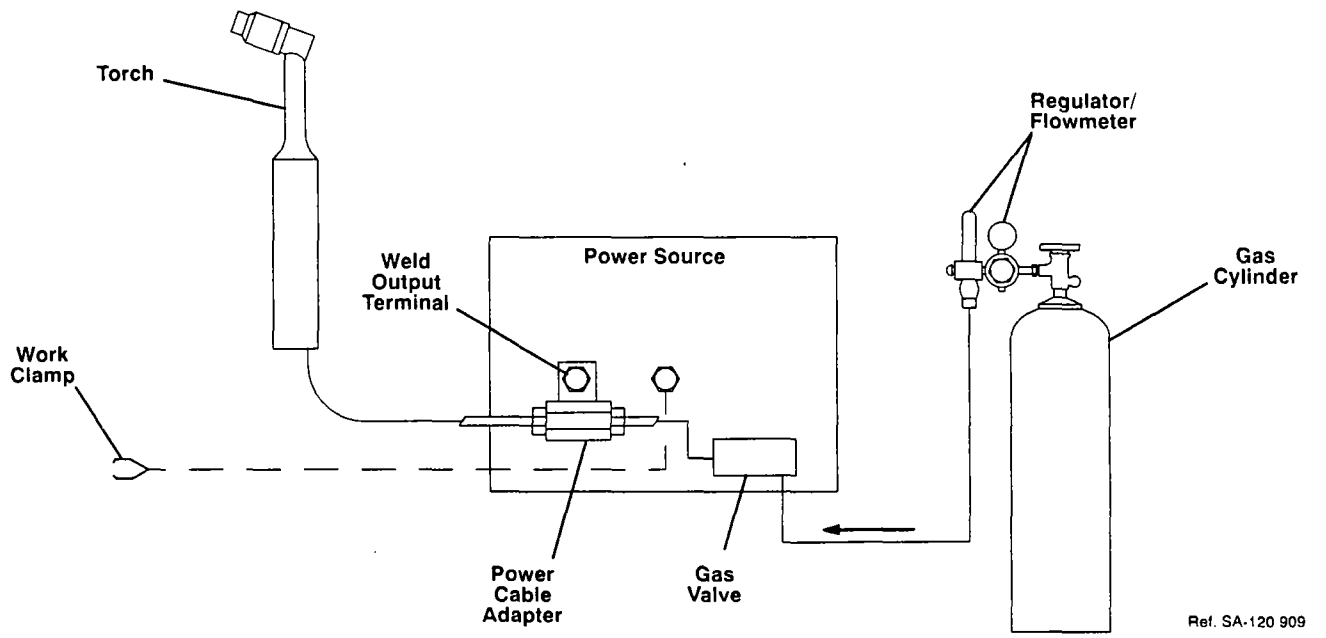


Figure 4-3. GTAW Torch Connection Diagram For Models Without Gas Valve

B. Torch Gas Valve Operation (If Applicable)

The gas valve allows gas flow control at the torch. A one-half turn counterclockwise opens the gas valve, and a one-half turn clockwise closes the valve.

The gas valve allows control of gas postflow time, or the length of time gas flows after the arc is extinguished. Insufficient gas postflow results in an oxidized (black) electrode surface. If an oxidized electrode were used, the black surface would contaminate the weld and cause poor arc direction.

IMPORTANT: *As a general rule, allow 10 seconds of gas postflow time per 100 amperes of weld current before closing valve.*

4-3. POWER CABLE CONNECTION (Figures 4-1 Thru 4-3)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source, and disconnect input power employing lockout/tagging procedures before installing torch.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

The power cable is part of the high flex cable assembly. For connection of both power cable and gas hose to power cable adapter, see Section 4-2A.

Connect power cable adapter to weld output terminal (see Figures 4-2 and 4-3).

SECTION 5 – SEQUENCE OF OPERATION

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Keep all covers and handle in place while operating.*

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Keep your head out of the fumes.*
- *Ventilate to keep from breathing fumes and gases.*
- *If ventilation is inadequate, use approved breathing device.*

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- *Watch for fire.*
- *Keep a fire extinguisher nearby, and know how to use it.*
- *Do not use near flammable material.*
- *Allow work and equipment to cool before handling.*

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- *Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.*

See Section 1 - Safety Rules for additional information.

5-1. GAS TUNGSTEN ARC WELDING (GTAW)

1. Install and connect torch according to Section 4.
2. Make sure collet body, cup, and all gas connections are securely tightened.
3. With regulator/flowmeter valve closed, open gas cylinder valve.
4. Set power source for desired welding amperage.
5. Wear dry insulating gloves and clothing, and wear welding helmet with proper filter lens according to ANSI Z49.1.
6. Energize welding power source.
7. Set gas flow to desired level (requires open gas valve).

IMPORTANT: *Purge gas hose to clear hose of air, moisture, or any other contaminants. Allow gas to flow 2 to 3 minutes on new torch; 5 to 6 seconds thereafter.*

8. Begin welding.

5-2. SHUTTING DOWN

1. Stop welding.

IMPORTANT: *As a general rule, allow 10 seconds of gas postflow time per 100 amperes of weld current before closing valve.*

2. Turn off welding power source.
3. Turn off the shielding gas at the source.

WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- *Shut off gas supply when not in use.*

SECTION 6 – MAINTENANCE

6-1. ROUTINE MAINTENANCE (Table 6-1)

WARNING: ELECTRIC SHOCK can kill; HOT SURFACES can cause severe burns.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power before working on torch.*
- *Disconnect torch from welding power source before inspecting, maintaining, or servicing.*
- *Allow a cooling period before servicing.*

Table 6-1. Maintenance Schedule

Frequency*	Maintenance
Every Week	Inspect and clean torch, cables, and hoses (see Sections 6-1A thru 6-1C).
	Check and replace torch parts or weld cables as necessary (see Sections 6-1A thru 6-1C).

*Frequency of service is based on units operated 40 hours per week. Increase frequency of maintenance if usage exceeds 40 hours per week.

A. Inspection And Cleaning

WARNING: Read and follow safety information at beginning of entire Section 6-1 before proceeding.

Inspect torch for broken areas, cracks and loose parts; tighten, repair and replace as required.

Remove grease and dirt from components, and moisture from electrical parts and cables.

B. Torch Body

WARNING: Read and follow safety information at beginning of entire Section 6-1 before proceeding.

Once a week inspect condition of torch body components.

Replace cup, heat shield, and O-ring if cracked. Maintain tight fit of torch components to ensure good weld quality.

C. Hoses, Connections, And Cables

WARNING: Read and follow safety information at beginning of entire Section 6-1 before proceeding.

Once a week inspect hoses and connections.

1. Gas

Gas leaks may result in poor weld quality. Inspect hoses for breaks. Keep connections clean and tight.

2. Power Cable

Inspect cables for breaks in insulation, and ensure that all connections are clean and tight. Repair or replace cables if insulation breaks are present. Clean and tighten connections at each inspection.

6-2. TUNGSTEN ELECTRODE (Table 6-2 And Figures 6-1 And 6-2)

Use Table 6-2 to select the correct size and type tungsten electrode. Prepare the tungsten electrode using the following guidelines. A properly prepared tungsten electrode is essential in obtaining a satisfactory weld.

A. For AC or DC Electrode Positive Welding (Figure 6-1)

Ball the end of tungsten electrodes used for ac or dc electrode positive welding before beginning the welding operation. Weld amperage causes the tungsten electrode to form the balled end. The diameter of the end should not exceed the diameter of the tungsten electrode by more than 1-1/2 times. For example, the end of a 1/8 in. (3.2 mm) diameter tungsten electrode should not exceed a 3/16 in. (4.8 m) diameter end.

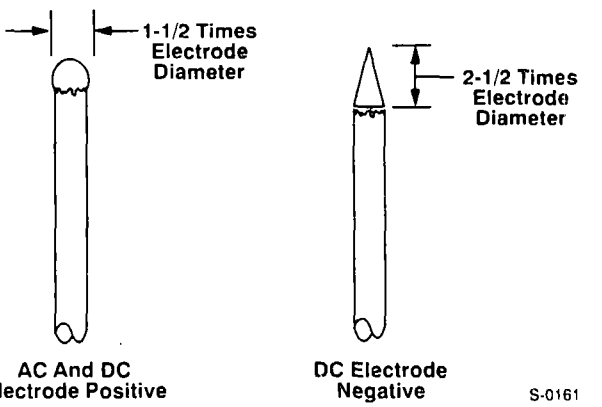


Figure 6-1. Properly Prepared Tungsten Electrodes

B. For DC Electrode Negative Welding (Figures 6-1 And 6-2)

CAUTION: HOT FLYING METAL PARTICLES can injure personnel, start fires, and damage equipment; TUNGSTEN CONTAMINATION can lower weld quality.

- *Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.*
- *Do not use same wheel for any other job, or the tungsten will become contaminated.*
- *Shape tungsten electrodes on a fine grit, hard abrasive wheel used only for tungsten shaping. Grind tungsten electrodes so that grinding marks run lengthwise with the electrode. These procedures reduce the possibility of the tungsten electrode transferring foreign matter into the weld and help reduce arc wander.*

Grind the end of the tungsten electrode to a taper for a distance of 2 to 2-1/2 electrode diameters in length. For example, the ground surface for a 1/8 in. (3.2 mm) diameter tungsten electrode should be 1/4 to 5/16 in. (6.4 to 8.0 mm) long.

For additional information, see your distributor for a handbook on the Gas Tungsten Arc Welding (GTAW) process.

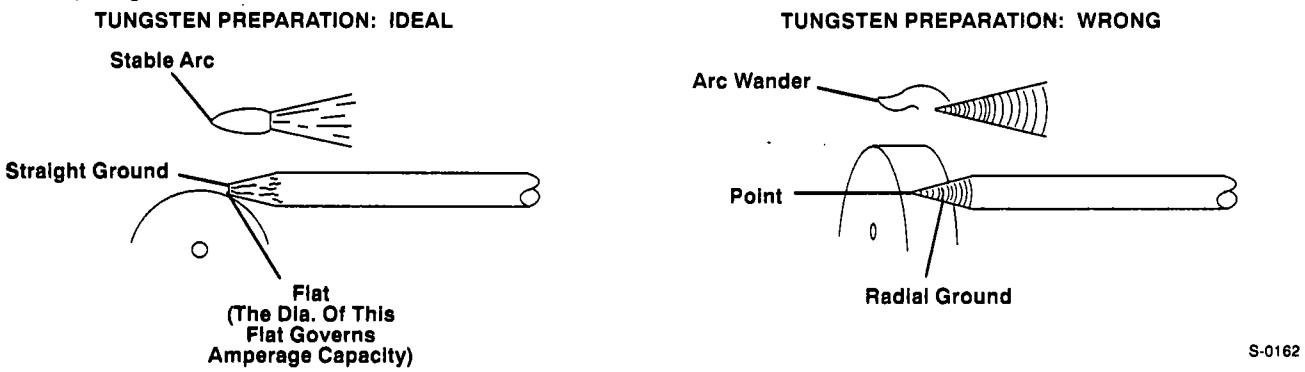


Figure 6-2. Tungsten Preparation

Table 6-2. Tungsten Size

Electrode Diameter	Amperage Range - Polarity - Gas Type			
Pure Tungsten (Green Band)	DC-Argon Electrode Negative/Straight Polarity	DC-Argon Electrode Positive/Reverse Polarity	AC-Argon Using High Frequency	AC-Argon Balanced Wave Using High Freq.
.010"	Up to 15	*	Up to 15	Up to 10
.020"	5-20	*	5-20	10-20
.040"	15-80	*	10-60	20-30
1/16"	70-150	10-20	50-100	30-80
3/32"	125-225	15-30	100-160	60-130
1/8"	225-360	25-40	150-210	100-180
5/32"	360-450	40-55	200-275	160-240
3/16"	450-720	55-80	250-350	190-300
1/4"	720-950	80-125	325-450	250-400
2% Thorium Alloyed Tungsten (Red Band)				
.010"	Up to 25	*	Up to 20	Up to 15
.020"	15-40	*	15-35	5-20
.040"	25-85	*	20-80	20-60
1/16"	50-160	10-20	50-150	60-120
3/32"	135-235	15-30	130-250	100-180
1/8"	250-400	25-40	225-360	160-250
5/32"	400-500	40-55	300-450	200-320
3/16"	500-750	55-80	400-500	290-390
1/4"	750-1000	80-125	600-800	340-525
Zirconium Alloyed Tungsten (Brown Band)				
.010"	*	*	Up to 20	Up to 15
.020"	*	*	15-35	5-20
.040"	*	*	20-80	20-60
1/16"	*	*	50-150	60-120
3/32"	*	*	130-250	100-180
1/8"	*	*	225-360	160-250
5/32"	*	*	300-450	200-320
3/16"	*	*	400-550	290-390
1/4"	*	*	600-800	340-525

*NOT RECOMMENDED
The figures listed are intended as a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

S-0009/6-88

Item No.	Stock No.	Model No.	Description	Quantity Model 24F	Quantity Model 24VF
			Figure 7-1. Complete Torch Assembly		
1			TUNGSTEN, electrode (consult your welding distributor)		
2			CUP, (see Fig 7-2)		
3			COLLET BODY, (see Fig 7-2)		
4			COLLET, (see Fig 7-2)		
5	120 602	80THS	HEAT SHIELD	1	1
6	116 540		TORCH BODY	1	
6	116 557		TORCH BODY		1
6	116 556		TORCH BODY, with valve (consisting of)		1
7	116 255	100VK	· VALVE KNOB, (consisting of)		1
8	116 254	100R	· · O-RING		1
9	117 585		HANDLE	1	1
9	118 516		HANDLE, model w/valve		1
10	♦116 572	1PCA	POWER CABLE ADAPTER	1	1
11	116 550	112PCW	HI-FLEX POWER CABLE, 12-1/2ft (consisting of)	1	1
11	116 551	125PCW	HI-FLEX POWER CABLE, 25ft (consisting of)	1	1
12	120 720		· RING NUT	2	2
13	120 723		· POWER CABLE NUT	2	2

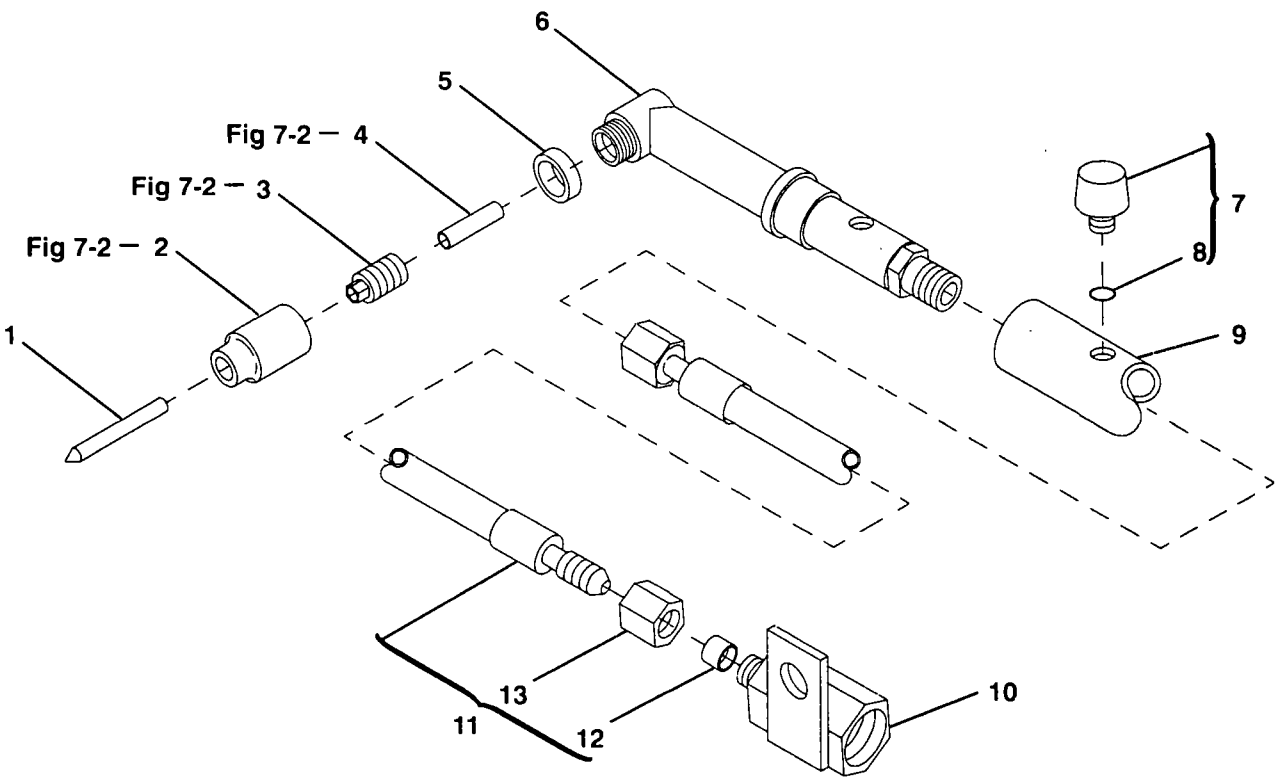


Figure 7-1. Complete Torch Assembly

♦OPTIONAL

BE SURE TO PROVIDE MODEL AND STYLE NUMBER WHEN ORDERING REPLACEMENT PARTS.

CONSUMABLE PARTS SELECTOR

Note: Collet, Collet Body, Gas Cup and Power Cable Adapter required to complete torch.

Tungsten Diameter	in. (mm)	.020" (0.5)	.040" (1.0)	1/16" (1.6)	3/32" (2.4)
Amperage Range	ACHF	5-20	10-80	50-150	100-235
	DCSP	5-20	15-80	70-150	150-250
Collet (Standard)	Model No.	8C20	8C40	8C116	8C332
	Stock No.	119 419	119 418	119 417	119 416
Collet Body (Standard)	Model No.	8CB20	8CB40	8CB116	8CB332
	Stock No.	119 883	119 884	119 885	119 886

	Stock/Model No.					Cup Orifice
Ceramic Cup 5/8" Long	119 411 (8C1)	■	■			.165"
	119 410 (8C4)	■	■	■		1/4"
	119 409 (8C5)	■	■	■		5/16"
	119 408 (8C6)			■	■	3/8"
Ceramic Cup 1-1/8" Long	119 421 (8C4L)	■	■	■		1/4"
	119 420 (8C6L)			■	■	3/8"

Shaded Areas Indicate Recommended Usage

Standard Collet 8C Series

Standard Collet Body 8CB Series

Use 80THS heat shield Stock No. 120 602

Gas Lens Collet 8CG Series

Gas Lens Collet Body 2GL Series

Use 8GHS heat shield Stock No. 119 887

Tungsten Diameter	in. (mm)	.020" (0.5)	.040" (1.0)	1/16" (1.6)	3/32" (2.4)
Amperage Range	ACHF	5-20	10-80	50-150	100-235
	DCSP	5-20	15-80	70-150	150-250
Collet (Gas Lens)	Model No.	8CG20	8CG40	8CG116	8CG332
	Stock No.	120 231	120 232	120 233	120 234
Collet Body (Gas Lens)	Model No.	2GL20	2GL40	2GL116	2GL332
	Stock No.	119 897	119 898	119 899	119 900

	Stock/Model No.					Cup Orifice
For Gas Lens Alumina Cup 1" Long	119 893 (2AG4)	■	■	■		1/4"
	119 894 (2AG5)	■	■	■		5/16"
	119 895 (2AG6)			■	■	3/8"
	119 896 (2AG7)				■	7/16"

CROSS REFERENCE TO COMPETITIVE MODEL

STOCK NO.	MODEL NO.	COMPETITIVE NO.
119 419	8C20	53N15
119 418	8C40	53N16
119 417	8C116	53N14
119 416	8C332	24C332
119 883	8CB20	53N17
119 884	8CB40	53N18
119 885	8CB116	53N19
119 886	8CB332	24CB332
119 411	8C1	53N23
119 410	8C4	53N24
119 409	8C5	53N25
119 408	8C6	53N27
119 421	8C4L	53N28
119 420	8C6L	53N26

CROSS REFERENCE TO COMPETITIVE MODEL

STOCK NO.	MODEL NO.	COMPETITIVE NO.
120 231	8CG20	53N62
120 232	8CG40	53N63
120 233	8CG116	53N64
120 234	8CG332	24GLC332
119 897	2GL20	45V41
119 898	2GL40	45V42
119 899	2GL116	45V43
119 900	2GL332	45V44
119 893	2AG4	53N58
119 894	2AG5	53N59
119 895	2AG6	53N60
119 896	2AG7	53N61

Figure 7-2. Consumable Parts And Cross Reference Chart

OPTIONS AND ACCESSORIES

POWER CABLE ADAPTERS

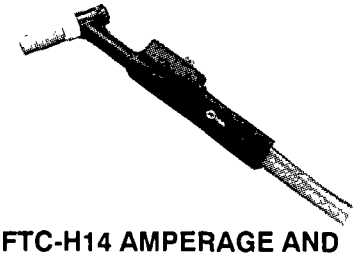
(Required on torches with one-piece, high-flex cable assembly and all water-cooled torches.)

Adapter	Stock No.
53N43	(#116 572)

INTERNATIONAL TIG TORCH CONNECTOR KIT

80 Amp Torch **(#135 492)**

For direct connection of one-piece torches or water-cooled TIG torches into power sources with International style connectors.



RFTC-H14 AMPERAGE AND CONTACTOR CONTROLS

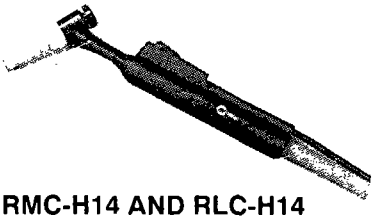
Torch handle with built-in contactor and amperage control. Includes 25 ft. (7.6 m) control cord with 14-pin plug for direct connection to all Miller solid-state TIG power sources.

RFTC-H14-S (#129 332)

Note: Cannot be used on torches with manual gas valve. For field installation only; replaces standard torch handle.

FTC-14 REMOTE CONTACTOR AND CURRENT CONTROL (#129 338)

Fastens to TIG torch handle. Includes 28 ft. (8.5 m) cord and 14-pin plug.



RMC-H14 AND RLC-H14 CONTACTOR SWITCHES

Torch handles with a built-in switch for remote contactor control of Miller solid-state TIG power sources. Includes 25 ft. (7.6 m) control cord with 14-pin Amphenol plug.

RMC-H14-S (Momentary) (#129 336)

RLC-H14-S (Locking) (#129 335)

Note: Cannot be used on torch with manual gas valve. For field installation only; replaces standard torch handle.

TIG HOSE HOOK-UP KITS (THK)

THK-2 (air-cooled) **(#128 066)**

Provides the necessary hoses and hardware to connect air-cooled torches to a power source.

GAS REGULATORS

HRF-2425 (#127 661)

The HRF-2425 regulator/flowmeter is designed for MIG, TIG, and other inert gas welding applications. It includes the 580 CGA inlet connector. The outlet pressure is preset at 25 PSIG; the maximum inlet is 3000 PSIG and has 5-40 SCFH gas delivery.

AF-150 (#127 662)

The AF-150 is a flowgauge regulator which includes the 580 CGA inlet connector for use with argon and argon/CO_2 gases. The AF-150 is adjustable for gas delivery of 8-25 SCFH with argon gas.

TIG TORCH CABLE COVERS

Reinforced plastic cable covers made of tear and flame resistant material. A large and small cover is available in length to fit 12-1/2 ft. and 25 ft. (3.8 and 7.6 m) torches.

CC-12S (#126 150)

For 12-1/2 ft. (3.8 m) torches.

CC-25S (#126 151)

For 25 ft. (7.6 m) torches.